



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|--------------------------|------------------|
| 10/766,298 | 01/27/2004 | Edward J. Sommer JR. | S1404.70004US01 | 9344 |
| 7590 | 08/25/2005 | | | EXAMINER |
| Daniel P. McLoughlin Wolf, Greenfield & Sacks, P.C. 600 Atlantic Avenue Boston, MA 02210 | | | MATTHEWS, TERRELL HOWARD | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3654 | |
| DATE MAILED: 08/25/2005 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/766,298 | SOMMER ET AL. | |
| | Examiner | Art Unit | |
| | Terrell H. Matthews | 3654 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-25 is/are pending in the application.
 - 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) Claim(s) ____ is/are allowed.
- 6) Claim(s) 1-25 is/are rejected.
- 7) Claim(s) ____ is/are objected to.
- 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>05/13/2004</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claims 1-25 are pending in the instant application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Referring to claims 1-14,19-21,25. Although, reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The use of reference characters is to be considered as having no effect on the scope of the claims. Accordingly, claims 1-14,19-21,25 are unclear when consideration is not given to the letters and numbers enclosed in the parentheses. The claims mentioned above should be rewritten without the uses of parentheses. Additionally, it is unclear as to what function is to be performed when the same letters are used to indicate two different steps. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Peleg (4884696).

Referring to claim 1-2. Peleg discloses a "Method and Apparatus for automatically inspecting and classifying different objects" as claimed. See Figs. 1-27 and respective portions of the specification. Peleg further discloses a method for inspecting and classifying objects inclusive of detecting x-rays fluoresced from the piece, detecting optical emissions emitted from the piece, and classifying the piece based on at least one of the detected x-rays or detected optical emissions (See Col. 8 l. 4-20).

Referring to claim 3,7-9. Peleg discloses using a laser to penetrate the inspected object and later describes when self-emitting objects are inspected inspection stations (5) and (6) may comprise detecting devices, for classification by the emitted radiation (See Col. 8 l. 18-20, 24-29).

Referring to claim 4-6. Peleg discloses that a stream of objects is delivered to the apparatus by suitable means such as a conveyor belt (1) (See Col. 55-57). Peleg further discloses conveying the piece of the area and sorting the piece based on the classification (See Col. 10 l. 10-16).

Referring to claims 10-12. Peleg discloses that radiation types such as X-rays, Y-rays, Lasers, etc are employed and that the attenuation pattern of the radiation transmitted through the objects are detected by sensors (6) is correlated to specific internal product features, by a suitable pattern recognition computer program (See Col. l. 10-20) and that after all the product features have been measured and the data

assimilated in the memory of the microcomputer, a suitable program determines the product category and executes a command for putting the object over the appropriate side delivery conveyor (17) carrying those classified objects (See Col. 10 l. 10-16).

Referring to claim 22-25. Peleg discloses a "Method and Apparatus for automatically inspecting and classifying different objects" as claimed. See Figs. 1-27 and respective portions of the specification. Peleg discloses a conveyor belt (1), roller conveyor (2), cup conveyor (3), inspection stations (5-7), and sensors (6). Peleg further discloses an apparatus for inspecting and classifying objects inclusive of detecting x-rays fluoresced from the piece, detecting optical emissions emitted from the piece, and classifying the piece based on at least one of the detected x-rays or detected optical emissions (See Col. 8 l. 4-20). Additionally, Peleg discloses that a computer program determines the product category and executes a command signal for placing the objects to the correct conveyor carrying the appropriate classified objects (See Col. 10 l. 10-16). Peleg discloses as well that the attenuation pattern of the radiation transmitted through the objects (4) as detected by sensors (6) is correlated to specific internal product features, by a suitable pattern recognition program (See Col. 8 l. 14-18).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peleg in view of Graft (6753957).

Referring to claim 9. Peleg discloses the invention as described in detail above. Smith does not disclose a method of vaporizing the portion of the piece using an electrical discharge. Graft discloses a "Mineral detection and content evaluation method" as claimed. See Fig 25 and respective portions of the specification. Graft further discloses a system and method for identification of specific species in samples in which the detection of those ions is performed by a source of irradiation, such as a laser energy emitter, or other suitable source excitation source, and means for delivering to and focusing the irradiation on a sample on a moving belt as well as a detection system and processor. It would have been obvious to a person of ordinary skill in the art at the time to modify the method of Smith to include the teachings of Graft and use any other suitable excitation source such as electrical discharge to vaporize the piece. The method of using an electrical discharge would have been used to save money on equipment cost.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peleg in view of Graft.

Referring to claim 13. Peleg discloses the invention as described in detail above. Peleg does not disclose a method of analyzing only the detected optical emissions to a reduced number of potential classifications and then classifying the piece of material as one of the reduced number of classifications based on the detected X-rays. Graft discloses the invention as previously disclosed above as well. Graft further discloses

analyzing only the detected optical emissions to reduce the predetermined number to a reduced number of potential classifications (See Col. 4 l. 65 – Col. 5 l. 6). It is understood as previously disclosed by Peleg that pieces of material are classified based on detected X-rays and optical emissions. It would have been obvious to a person of ordinary skill in the art to modify the method of Peleg to include the teachings of Graft and to analyze only the detected optical emissions to reduce the number of potential classifications so that certain elements could be focused on for more precise classification.

Referring to claim 14-19. Peleg discloses the invention as described above. Peleg does not disclose determining that a threshold percentage of the collected optical emissions were emitted by one or more particular elements within the piece, the particular element being a low-Z element, aluminum, belonging to the same alloy group, or an aluminum alloy group. Graft discloses determining a threshold for the collected optical emissions being representative of the composition of the element in the subject deposit so that it is possible to differentiate between wanted and unwanted samples (See Col. 5 l. 25-27). Graft further discloses performing a screening, which is characteristic of the emission properties of the ion or elemental species contained in the sample to make a positive detection of a desired sample. It would have been obvious to a person of ordinary skill in the art to modify the method of Peleg to include the teachings of Graft so that a threshold percentage of the collected optical emission were emitted by one or more particular elements so that it was possible to screen and classify low-Z elements, aluminum, alloys belonging to the same group, or alloys belonging to

an aluminum alloy group. This would have been done so that it was easier to screen and classify particular elements or alloy groups from a mixed stream of elements. Additionally, it is understood that it would have been obvious to a person of ordinary skill in the art to analyze only the detected x-rays and to classify based on the detected optical emissions depending on the type of element you are sorting and classifying. It should be understood that Peleg discloses radiation sources, sensors, and detecting devices for classifying based on the emitted radiation and characteristics. (See Col. 9 l. 55-60 & Col 10. l. 10-16).

Referring to claim 20. Peleg discloses the invention as described above. Peleg does not disclose creating one or more emissions spectra from the detected x-rays and detected optical emissions, estimating peak values for one or more regions of interest of the one or more spectra, or applying a shape fitting function to the data corresponding to the one or more regions. Graft discloses the invention as described above. Graft further discloses obtaining emissions spectra using different power levels and different excitation wavelengths (See Col. 5 l. 39-41). Additionally, Graft discloses estimating peak values for one or more regions of interest of the one or more spectra through means of a computer algorithm to calculate the subject fraction content of desired and undesired elements (See Col. 6 l. 7-16). It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the apparatus of Peleg to include the teachings of Graft so that you could screen more precisely for elements having certain characteristics.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Smith U.S. Patent No. 5628410 discloses a "Classifying or Sorting" method and apparatus that teaches irradiating items with X-rays or visible radiation in which the fluorescence or Raman emission of objects is detected to give a signal that can be used for selecting certain objects from a stream of mixed materials. Smith also teaches using two wavelengths to help sort and classify the objects.

Kumar U.S. Patent No. 6545240 discloses a "Metal Scrap Sorting System" method and apparatus that teaches conveying articles with a conveyor and using laser-induced breakdown spectroscopy which includes a image detector, position detector, laser system, scanner assembly, a light distribution, and spectral analyzer for measuring at least one selected band from the collected light.

Kelly U.S. Patent No. 4848590 discloses a "Apparatus for the multi-sorting of scrap metals by X-ray analysis" that teaches passing articles through x-ray analysis system including a high energy rays to induce x-ray fluorescence and a detector to detect the fluorescence in which the detector provides signals indicating the type of metal so that when pieces pass by blast nozzles they are deflected on a specific classification path.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrell H. Matthews whose telephone number is (571)272-5929. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kathy Matecki can be reached on (571) 272-6951. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

THM

Kathy Matecki
KATHY MATECKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600